United States
Environmental Protection
Agency

Office of
Water Programs
Washington DC 20460

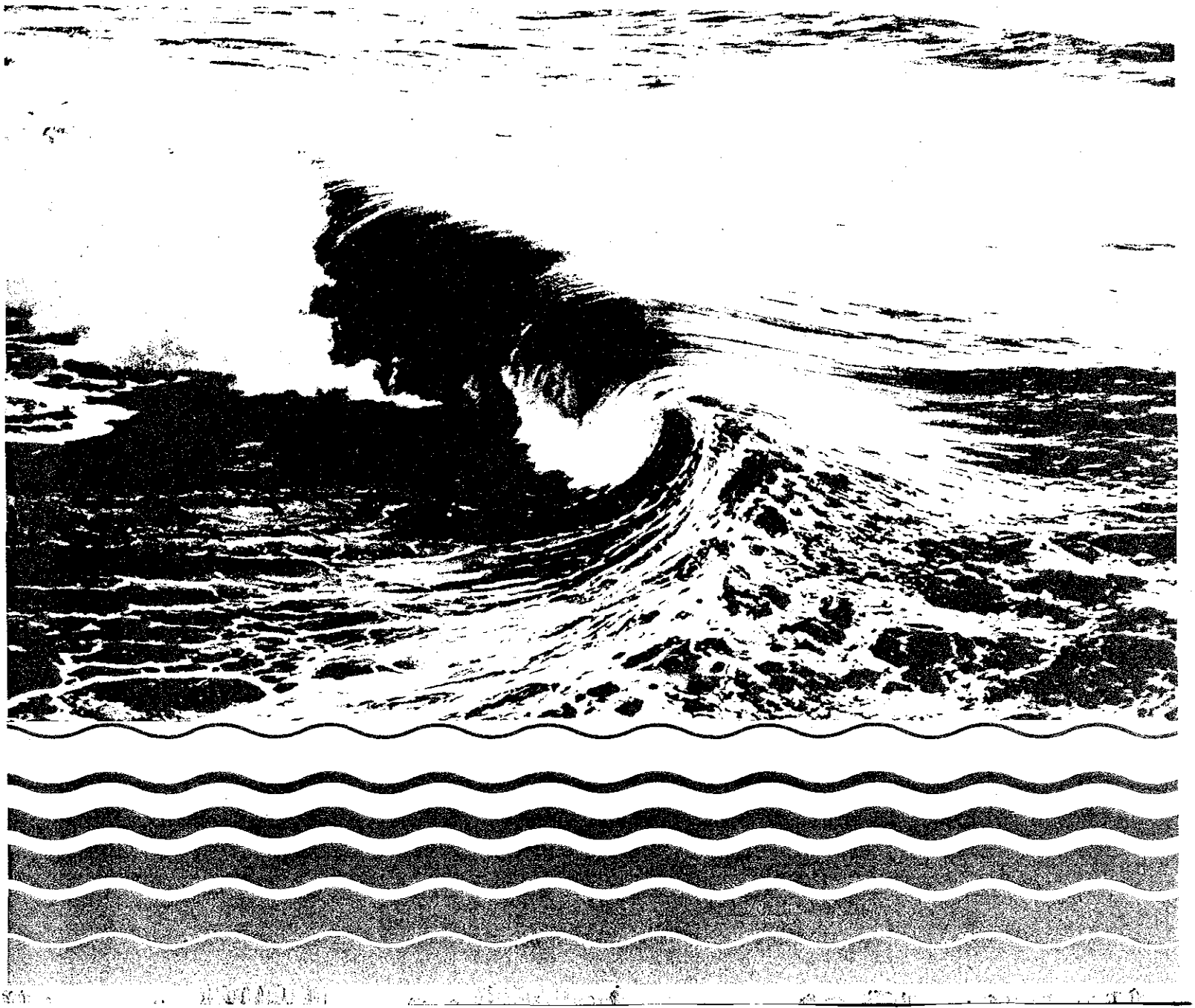
June 1979

Water

EPA

Annual Report to Congress Jan.-Dec. 1978

On Administration of the Marine Protection, Research, and Sanctuaries Act of 1972, as Amended (P.L. 92-532) and Implementing the International Ocean Dumping Convention



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUL 19 1979

THE ADMINISTRATOR

Honorable Walter F. Mondale
President of the Senate
Washington, D.C. 20510

Dear Mr. President:

Section 112 of the Marine Protection, Research, and Sanctuaries Act of 1972, as amended, requires the Administrator of the Environmental Protection Agency (EPA) to submit an annual report on the administration of the ocean dumping permit program authorized under Title I of the Act. The seventh annual report for this program is transmitted with this letter.

The ocean dumping permit program became effective on April 23, 1973, and final regulations and criteria were published on October 15, 1973. Revisions to those regulations and criteria were published on January 11, 1977. This report covers the activities carried out under the Act and those necessary to implement the Ocean Dumping Convention during calendar year 1978.

The dumping into ocean waters of all material except dredged material, is regulated by EPA permits; the U.S. Army Corps of Engineers issues permits for dredged materials. We believe that the permit program has brought the previously unregulated practice of ocean dumping under strict control.

Sincerely yours,

Barbara Blum Acting

Douglas M. Costle

Enclosure

INTRODUCTION

This is the Environmental Protection Agency's (EPA) seventh annual report to the Congress on the implementation of Title I of the Marine Protection, Research, and Sanctuaries Act of 1972, (MPRSA) as amended. The report covers the Agency's authorities and responsibilities under the Act in carrying out the ocean dumping program and reviews those program activities conducted within EPA Headquarters, the Regions, and the Office of Research and Development.

Three other agencies having responsibilities under the MPRSA, the U.S. Army Corps of Engineers, the U.S. Coast Guard, and the National Oceanic and Atmospheric Administration, will each submit separate reports on their activities in implementing the Act. Therefore, this report does not contain a discussion of their activities under the Act except as they impact the responsibilities of EPA.

With the closing of calendar year 1978, the ocean dumping permit program has been operational for slightly more than five years. Therefore, it seems appropriate that this report highlight the Agency's significant activities and actions in a summary of the progress of each of the first five years (1973-1977) of the program before presenting a review of the activities conducted during 1978.

The Ad Hoc Legal Group presented proposed draft procedures for the resolution of disputes arising under the Convention. The procedures were to be considered in the form of amendments to Articles X and XI. Following initial discussion, a working group was established to resolve issues over the proposed procedures. The text was revised and presented to the Contracting Parties; it was widely debated and additional changes made. Adoption of the dispute settlement procedures was finally submitted to a vote and passed by a two-thirds majority.

As provided by Article XV procedures, these amendments to the Convention (Articles X and XI) will enter into force, for the Parties which have accepted them, on the sixtieth day after two-thirds of the Parties have deposited an instrument of acceptance with the Organization.*

The Meeting accepted the Report of the Ad Hoc Scientific Group and, after some discussion, adopted the recommended draft guidelines for the interpretation of "trace contaminants" and "rapidly rendered harmless" on an interim basis. The definitions and test procedures are based on and consistent with existing U.S. ocean dumping regulations; their adoption by the Contracting Parties gives international recognition to the use of bioassay techniques for regulating ocean dumping.

The Scientific Group also advised the Meeting that further studies are necessary on the technical information submitted with the proposals for amending Annexes I and II of the Convention before consideration can be given to their adoption. The Group will give this matter high priority at the next intersessional meeting and submit their recommendations to the Fourth Consultative Meeting.

The IAEA presented a Revised Definition and Recommendations on the Ocean Dumping of Radioactive Substances. Various suggestions were made for further improvement, but the Meeting was in general agreement that the revisions were a significant improvement over the Provisional Definition and Recommendation. The Meeting further agreed to request that IAEA keep the document under continuing review, based on comments submitted by the Contracting Parties and on developments in technology and increased scientific knowledge.

The Fourth Consultative Meeting will be held in October 1979 and intersessional meetings of the Ad Hoc Group on Incineration at Sea

*The State Department has prepared and forwarded the necessary documents requesting the U.S. Senate give advice and consent to ratification of the amendments to Articles X and XI.

and the Ad Hoc Scientific Group on Dumping will be convened intersessionally to continue work on recommended Technical Guidelines on Incineration at Sea and to review proposals for amending the Annexes to the Convention.

In October 1978, the U.S. Department of State and EPA jointly prepared and published the "Draft Environmental Impact Statement for Incineration of Wastes at Sea Under the Ocean Dumping Convention", in anticipation of U.S. participation in the negotiations of the Third Consultative Meeting to amend the Convention. The recommended Federal action in the draft environmental impact statement (EIS) was to negotiate and adopt amendments, proposed by the United States, to Annexes I and II of the Convention to establish regulations and guidelines for incineration of wastes at sea.

The comments received on the Draft EIS were generally favorable; however, some expressed concerns indicated misunderstandings about the Convention itself and the need for the EIS to explain the amending procedures and what further actions would need to be taken by the U.S. in the adoption process.

The Final EIS was published in February 1979. The proposed Federal action was to accept the amendments to Annexes I and II of the Convention and the regulations for incineration of wastes at sea. This change from the proposed action called for in the Draft EIS reflected the action of the Contracting Parties in adopting the amendments during the Third Consultative Meeting.

The United States chose not to reject the amendments. Under the 100-day acceptance period by Contracting Parties (Article XV), the amendments became effective on March 11, 1979.

While the Convention amendments are binding on the United States, EPA plans to take additional steps to reflect the amendments in domestic regulations. During the interim period, EPA will include these requirements as permit conditions before authorizing incineration at sea. EPA will also designate all specific burn sites for at-sea incineration and will prepare EISs before promulgating interim or final national regulations and designating each new burn site.

TABLE III

TYPES AND AMOUNTS OF OCEAN DISPOSAL
BY GEOGRAPHIC AREA
(IN APPROX. TONS)
1973 - 1978

WASTE TYPE	(A) ATLANTIC					
	1973	1974	1975	1976	1977	1978
Industrial Waste	3,642,800	3,642,000	3,322,300	2,633,200	1,783,600	2,548,000*
Sewage Sludge	4,898,900	5,010,000	5,039,600	5,270,900	5,134,000	5,535,000**
Construction and Demolition Debris	973,700	770,400	395,900	314,600	379,000	241,000
Solid Waste	0	0	0	0	< 100	0
Explosives	0	0	0	0	0	0
Incinerated (Wood)	10,800	15,800	6,200	8,700	15,100	18,000
Incinerated (Chemicals)	0	0	0	0	0	0
TOTALS	9,526,200	9,438,200	8,764,000	8,227,400	7,311,700	8,342,000

* 1978 increase over 1977 due to plant shut down during a strike in 1976-77 at NL Industries (a permittee).

** 1978 increase primarily due to upgrading of sewage treatment plants to secondary treatment in NYC, Middlesex Co. and Joint Mtg. of Essex & Union Cos.

WASTE TYPE	(B) GULF					
	1973	1974	1975	1976	1977	1978
Industrial Waste	1,408,000	937,7000	119,600	100,300	60,200	173
Sewage Sludge	0	0	0	0	0	0
Construction and Demolition Debris	0	0	0	0	0	0
Solid Waste	0	0	0	0	0	0
Explosives	0	0	0	0	0	0
Incinerated (Wood)	0	0	0	0	0	0
Incinerated (Chemicals)	0	12,300	4,100	0	17,600	0
TOTAL	1,408,000	950,000	123,700	100,300	77,800	173

WASTE TYPE	(C) PACIFIC					
	1973	1974	1975	1976	1977	1978
Industrial Waste	0	0	0	0	0	0
Sewage Sludge	0	0	0	0	0	0
Construction and Demolition Debris	0	0	0	0	0	0
Solid Waste	240	200	0	0	0	0
Explosives	0	0	0	0	0	0
Incinerated (Wood)	0	0	0	0	0	0
Incinerated (Chemicals)	0	0	0	0	12,100	0
TOTAL	240	200	0	0	12,100	0

TABLE III (cont.)

WASTE TYPE	TOTALS OF A, B, AND C (In Approx. Tons)					
	1973	1974	1975	1976	1977	1978
Industrial Waste	5,050,800	4,579,700	3,441,900	2,733,500	1,843,800	2,548,173
Sewage Sludge	4,808,900	5,010,000	5,039,600	5,270,900	5,134,000	5,535,000
Construction and Demolition Debris	973,700	770,400	395,900	314,600	379,000	0
Solid Waste	240	200	0	0	< 100	0
Explosives	0	0	0	0	0	0
Incinerated (Wood)	10,800	15,800	6,200	8,700	15,100	18,000
Incinerated (Chemicals)	0	12,300	4,100	0	29,700	0
TOTAL	10,934,440	10,388,400	8,887,700	8,327,700	7,401,600	8,101,173

TABLE IV

SUMMARY OF OCEAN DUMPING PERMITTEES/APPLICANTS
DENIED OR PHASED OUT FROM 1973 to 1978

		REGION						
		I	II	III	IV	VI	IX	Totals
Action prior to April 1973								
	phased out	--	44	--	--	--	--	44
During the remainder of 1973								
	withdrew	--	4	--	--	--	--	4
	phased out	--	1	--	--	1	--	2
	denied	--	--	--	--	1	--	1
During 1974								
	withdrew	--	2	--	--	--	1	3
	phased out	--	21	--	--	1	--	22
	denied	--	1	1	--	1	1	4
During 1975								
	withdrew	--	6	--	--	--	--	6
	phased out	1	10	1	--	2	--	14
	denied	--	--	--	--	--	--	--
During 1976								
	withdrew	--	2	--	--	--	--	2
	phased out	--	17	--	--	--	--	17
	denied	--	130	--	--	1	--	131
During 1977								
	withdrew	--	2	--	--	--	--	2
	phased out	1	16	--	--	1	--	18
	denied	--	--	--	--	--	--	--
During 1978								
	withdrew	--	1	--	--	--	--	1
	phased out	--	31	--	--	1	--	32
	denied	--	1	--	--	--	--	1
	Totals	2	279	2	--	9	2	304

TABLE V

OCEAN DUMPING PERMITS PHASED OUT
BY EPA REGION II DURING 1978

Permittee	Location	Date
Camden Dept. Public Works	New Jersey	June 1978
Wood-Ridge STP	New Jersey	Nov. 1978
Caldwell Boro STP	New Jersey	Aug. 1978
Chatham STP	New Jersey	Mar. 1978
Neptune Twp - Ocean Grove	New Jersey	June 1978
Oakland Boro	New Jersey	June 1978
Passaic Twp	New Jersey	Feb. 1978
Pompton Lakes	New Jersey	June 1978
Wayne Twp.	New Jersey	June 1978
Reheis Chemical Co.	New Jersey	Dec. 1978
Domestic Septic Tank Wastes	New Jersey	Apr., Jan. & Dec. 1978
AAA Tank Service		
A&M Environmental Service		
Caldwell Trucking Co.		
King Cesspool Service		
Material Resources		
Mola Septic Services		
William Schaefer		
Welsh Farms		
All County Septic		
Modern Transportation Co.		
General Marine Trans. Corp.		
PCI Sanitary Corp.		
Barry Kruger Disposal Co.		
R&R Sanitation		
G. L. Redner, Inc.		
Harris Sanitation		
Gaess Envir. Services		
Central Jersey Septic		
Middletown Septic Service		
Port-O-Let Co.		
Oswald Brothers		
Horstmann & Giardine		
PCI Services Unlimited		

BASELINE AND MONITORING SURVEYS OF OCEAN SITES FOR SITE DESIGNATION

Section 102(c) of the Act authorizes the Administrator to designate areas where ocean dumping may be permitted and any critical areas where dumping may be prohibited. The Act gives EPA the authority to designate ocean dumping sites for dredged material, as well as for sewage sludge, industrial wastes and other matter.

The current Ocean Dumping Regulations and Criteria list 141 sites designated for ocean dumping. The 141 sites include 14 for municipal and industrial wastes and 127 for dredged material. All but one, the Gulf of Mexico ocean incineration site, are designated as interim approved and were based primarily on historical use. The philosophy behind this thinking is that until an adequate data base is developed to indicate whether or not an adverse impact occurs from dumping, it is better environmentally to risk damage to isolated locations which have been used in the past than it would be to arbitrarily select new sites and risk greater marine environmental impacts. EPA has made the commitment to prepare an environmental impact statement (EIS) in support of each site designated for use on a continuing basis. This requires the intensive collection of environmental data as baseline surveys at the dumpsites and adjacent areas. Monitoring surveys continually measure and assess conditions at each site.

The baseline survey program began in 1974, and studies have been conducted on a continuing basis since that time. In July 1977, a contract was negotiated for preparing EISs on sites deemed high priority based on location and usage. The contract called for the collection, analysis and evaluation of all available data on the sites, with options to conduct baseline surveys to supplement pre-existing information and preparation of EISs.

In January 1978, in anticipation of the survey work required and to effectively conduct the surveys in a timely and cost-effective manner, EPA acquired a surplus Navy ship (USS Antelope), and initiated its conversion to an Oceanographic Survey Vessel (OSV).

The COE has provided funds to study some dredged material dumping sites under this contract. The focus is on those sites representing diverse ecological environments and receiving large volumes of material. EISs are being prepared on 5 municipal and industrial sites and on 21 dredged material locations, including 34 specific sites (Table IV). This current dumpsite designation program is expected to be completed in 1981. EPA is working closely with the COE in this activity as well as in the development and implementation of criteria and procedures for testing the acceptability of dredged material for ocean disposal.

Ocean disposal of municipal sewage sludge and industrial wastes in the New York Bight is a regional issue of intense public interest and concern. In the United States, the majority of such dumping occurs at sites managed by EPA Region II. Over 90 percent of all dumping of sewage sludge, acid wastes, construction debris, and chemical wastes takes place at EPA-designated ocean dumpsites in the Bight.

Another important area of effort is monitoring these sites. Over the past three years EPA has supported the development of new technology for monitoring the impacts of ocean dumping. Biological monitoring devices have been designed to detect sublethal changes in the enzyme balances of marine organisms which may occur before any toxic effects become evident. During the summer of 1978, these Biotal Ocean Monitors (BOMs) were used as an operational monitoring tool in the New York Bight. Further studies are planned for this coming summer.

Two cruises were conducted during 1978 in conjunction with studies of the EPA Region III Philadelphia sewage sludge dumpsite. The scientific investigations included sampling at historical stations (with hydrocasts, dredge casts, and sediment samples), intensive grid studies to determine local effects of pollution on benthic organisms, and current meter deployment. The information from these cruises will be used by EPA along with the past data in preparation of an EIS on this site.

An extensive monitoring program was initiated in 1973 by Region II to provide data on chemical and bacterial quality of water and bottom sediments in the Bight and along the beaches. Over 100 sampling points up to 25 miles offshore are sampled by helicopter or boat at least once a week. Tests include dissolved oxygen, nutrients, suspended solids, organics, temperature, salinity, and bacteria. Along the Long Island and New Jersey beaches frequented by swimmers forty-five stations are sampled for bacteria at least three times weekly during the critical summer months. Data is also collected by municipal dumpers, as part of an EPA-imposed monitoring program, and reported daily to EPA. In addition, at the end of each NOAA research cruise, reports on any significant aberration in oceanographic data in the Bight are submitted for EPA's evaluation. Visual observation of the waters for floatables, slicks, and other pollutants, using EPA and USCG helicopter overflights, has been expanded. Thus, the availability of water-quality data is now greatly improved,

TABLE VI

EPA/COE SITES FOR EISs AND DESIGNATION

Municipal and Industrial Sites

East Coast

106 Mile Industrial
Philadelphia Sludge
New York Acid
Cellar Dirt
North Atlantic Incineration

Dredged Material Sites

East Coast

San Juan, PR
Viegas Pass, PR
Jacksonville, FL
Savannah - Charleston - Wilmington
New York Mud Dump
Long Island - New Jersey Inlets
Portland, ME

Gulf

Tampa, FL
Pensacola - Mobile - Gulfport
Sabine - Neches, TX
Galveston, TX

West Coast

Honolulu
LA/San Diego, CA
LA/Long Beach, CA
Moss Landing, CA
San Francisco Bay, CA
San Francisco-100 fathom
Humbolt, CA
Coos Bay, OR
Columbia River, OR
Nome, AK

Radioactive Waste Dumpsite Surveys

Since 1974 and through 1978, EPA has conducted environmental assessment surveys at four radioactive waste disposal sites used by the U.S. in the past. These include two sites 40 miles off the California coast at the Farallon Islands, at depths of 900m and 1700m, and two sites in the Atlantic 120 miles and 200 miles off the Maryland-Delaware coast at depths of 2800m and 3800m respectively.

The earlier 1974-1976 EPA surveys at the 900m, 1700m and 2800m sites are discussed in the EPA Fourth and Fifth Annual Reports on Ocean Dumping. A significant achievement during the 1976 survey at the Atlantic 2800m site was first-time recovery of a radioactive waste container, with the use of a manned submersible. The container withstood ocean bottom conditions relatively well during its fifteen-year life in the deep sea. Preliminary results of the drum analysis indicate that cobalt-60, contained in filters, was the primary radioactive waste in the 80-gallon mild steel drum and that cesium-137 was found throughout the concrete matrix suggesting that low-level liquid waste containing cesium-137 was used to slurry the concrete used as the drum matrix. There were varying degrees of corrosion over the surface of the container, with enhanced corrosion at the sediment-buried regions. Cobalt-60 was not detected in the sediments surrounding the container, suggesting no leakage of the cobalt-60 from this waste package.

A. Farallon Islands 900m and 1700m Dumpsite Survey-1977

The EPA Fifth Annual Report on Ocean Dumping discusses the levels of plutonium-238 and plutonium-239,-240 found in the sediments adjacent to radioactive waste containers at these two west coast dumpsites. Although these findings confirmed the fact that the containers have been the source for plutonium release, the concentrations found to date do not appear to represent a risk to man or to the marine environment.

During the 1977 survey on these sites, conducted in two phases and with the assistance of the Canadian Department of Environment and a manned submersible, further radiological, chemical, and biological characterizations of these dumpsites were accomplished. In addition, bottom currents were examined through the long-term deployment of current meters, and deep and mid-water organisms were identified for assessments of potential for food-chain transport.

At the 900m site during the second phase of operations, a radioactive waste container was selected and recovered from this oxygen-minimum zone in order to compare corrosion processes with more highly oxygenated regions, such as the region from which the drum was recovered in 1976. The intent is to determine whether corrosion is significantly retarded in regions of lower oxygen concentration and whether this represents an important site-selection characteristic.

B. Atlantic 3800m Dumpsite Survey-1978

This site received approximately 15,000 containers of radioactive waste with an estimated activity of 2100 curies between the years 1957 and 1962; it was examined for the first time in 1978. It is the only historical U.S. nuclear waste dumpsite having depths consistent with the 4,000 meters or greater depths recommended by the International Atomic Energy Agency (IAEA); therefore, it can be used to obtain data on the long-range environmental effects of dumping at sites typical of those which may be considered in the future for use by Contracting Parties to the Ocean Dumping Convention.

A manned submersible was used to obtain precisely-located sediment samples at measured distances from selected waste drums to determine the concentration gradient and therefore the retention capabilities of sediment for released radioactive particulates. The submersible was also invaluable for direct observation of deepsea biota, sediment surface conditions, and the geological and physical processes at work in the site. Box cores were taken from a surface ship to examine biological populations living within the sediments, and deepsea bottom trawls were conducted in order to taxonomically identify bottom-dwelling organisms. In addition, a radioactive waste container was recovered, making this the third such successful operation for EPA, and the deepest recovery to date. The container is currently being examined for comparative corrosion analysis with similar drums recovered at the Atlantic 2800m dumpsite and the Pacific 900m dumpsite. This drum recovery demonstrates retrieval capability for radioactive waste packages from any dumpsite in the world where disposal has occurred at or very near the internationally recommended minimum acceptable disposal depth of 4,000 meters or greater.

ENFORCEMENT

Surveillance and enforcement activities to prevent unlawful dumping, transportation of materials for dumping, and to assure compliance with ocean dumping permit conditions are the responsibility of the U.S. Coast Guard.

Ocean dumping permits require permittees to give authorities advance notification prior to commencing any dumping operations. The Coast Guard conducts surveillance of the operations by several methods, including vessel or aircraft escort or interception of dumping vessels, in-port boardings and inspections, shipriders on board to observe dumping operations, and Vessel Traffic Services (VTS) radar. Operational testing of a recently developed electronic recording device, the Ocean Dumping Surveillance System (ODSS), was completed in June 1978. Future plans call for the installation of operational systems on board dumping vessels through issuance of regulations. As of the end of 1978, proposed rules had not been published.

During 1978 a total of 1,030 surveillance missions were conducted--173 on dumps of industrial waste and 857 on dumps of other wastes, representing respectively a 53 percent and 21 percent Coast Guard surveillance coverage for the two categories of wastes. The missions were accomplished by the following methods: 120 by vessels, 682 by aircraft, 179 by shipriders, 7 by VTS radar, and 42 by ODSS during operational testing.

In calendar year 1978, the Coast Guard referred to EPA Regional Offices 9 cases that involved 9 alleged violations which included, among others, 4 for dumping at an improper dispersal rate, and 2 for failure to provide proper notification.

In addition to Coast Guard surveillance, alleged violations are also detected by EPA and occasionally reported to EPA by other organizations and private citizens. Regional Offices follow up on all reports and investigate each case. In cases where violations are substantiated, complaints are issued and procedures taken under EPA enforcement regulations.

Table VII identifies enforcement actions taken by EPA during 1978 and the disposition of each case. Also included are several cases for which action had been pending from a previous year and final disposition occurred in 1978.

In late 1977, EPA Region III initiated enforcement actions against the City of Philadelphia for failure to comply with their implementation schedule for phasing out ocean dumping. Following

an adjudicatory hearing, litigation was carried out and in 1978 a fine of $225,000 was levied against the City. The case has since been resolved in Federal District Court by the City signing a consent decree to end ocean dumping and paying a fine totaling $2,165,000.

The number of cases forwarded to EPA during 1978 is a significant reduction compared to the previous two years. Two factors contribute to this smaller number. In past years, there had been a high number of alleged violations for failure to properly notify the Coast Guard in advance of departure. Discussions between the applicable Coast Guard field units and the waste transporters involved have led to very good compliance with this permit provision. Additionally, most of the past violations resulted in letters of warning from EPA with notification that stronger action would be taken in the future. Where there were 77 such alleged violations in 1977, only two were reported in 1978.

The second factor concerns fewer violations of the permit provision establishing the dispersal rate to be used when discharging waste material. In 1977, there were 126 such reported violations. All were for permitted activity involving sewage sludge disposal in EPA Region II (Third Coast Guard District). Permits for sewage sludge disposal required dispersal of material in the dumpsite over a distance of five nautical miles at a speed not exceeding five knots. One waste transporter was not complying with the speed and time requirements until the notice of violation was received. In addition to compliance during 1978 (only four violations--all in 1977--were reported to EPA), a question was raised over the equity of this dispersal rate. Smaller vessels with less capacity previously had had to spend a minimum of one hour dumping even though their loads were less. A new dispersal rate of 15,500 gallons per minute at a vessel speed of not less than three knots has been incorporated in 1978 permit renewals. This new rate will treat all vessels fairly since it is dependent on cargo quantity.

TABLE VII
ENFORCEMENT ACTIONS

ORDER NO.	RESPONDENT'S NAME	REFERRAL FROM	TYPE OF VIOLATION	COMPLAINT ISSUED	DISPOSITION	DISPOSAL SITE
Region I						
	Vessel - Trans-oceanica Elena	USCG	Dumping without a permit	6/11/78	$2500 penalty payment - 4/18/79	13 miles off coast of Mass.
Region II						
76-10	Allied Chemical Corp.	USCG	Dumped outside authorized dump site	11/12/76	Final Order-2/14/78 Charges withdrawn	Acid wastes
76-11	The City of New York	USCG	Dumped outside authorized site	11/12/76	Final Order-2/14/78 Charges withdrawn	Sewage sludge
77-5/11	General Marine Trans. Corp.	USCG	Dumping at a faster rate and over a shorter distance than permitted	3/22/77 & 5/11/77	Final Order-6/23/78 Charges withdrawn	Sewage sludge
78-1	Joint Mtg. of Essex and Union Co.	EPA	Permit condition, Compliance schedule	2/22/78	Pending	Sewage sludge
78-2	Middletown Twp. Sewerage Auth.	EPA	Permit condition, Compliance schedule	2/22/78	Final Order-10/28/78 Revision of schedule	Sewage sludge
78-3	Rahway Valley Sewerage Auth.	EPA	Permit condition, Compliance schedule	2/22/78	Pending	Sewage sludge
78-4	Linden-Roselle Sewerage Auth.	EPA	Permit condition, Compliance schedule	2/22/78	Pending	Sewage sludge
78-5	Town of Kearny	EPA	Permit condition, Compliance schedule	2/22/78	Final Order-12/8/78 Cessation required by 4/30/79	Sewage sludge
78-6	Borough of Wood-Ridge	EPA	Permit condition, Compliance schedule	2/22/78	Final Order-12/1/78 Charges withdrawn	Sewage sludge
78-7	Twp of Cedar Grove	EPA	Permit condition, Compliance schedule	2/22/78	Final Order-3/19/79 revision of schedule	Sewage sludge

TABLE VII

ENFORCEMENT ACTIONS (CONT.)

ORDER NO.	RESPONDENT'S NAME	REFERRAL FROM	TYPE OF VIOLATION	COMPLAINT ISSUED	DISPOSITION	DISPOSAL SITE
78-8	Twp of Chatham	EPA	Permit condition, Compliance schedule	2/22/78	Final Order-3/2/78 Charges withdrawn	Sewage sludge
78-9	Twp of Morris	EPA	Permit condition, Compliance schedule	2/22/78	Final Order-5/31/78 Revision of schedule	Sewage sludge
78-10	Twp of Roxbury	EPA	Permit condition, Compliance schedule	2/22/78	Final Order-5/31/78 Revision of schedule	Sewage sludge
78-11	Twp of Washington	EPA	Permit condition, Compliance schedule	2/22/78	Final Order-12/13/78 Revision of schedule	Sewage sludge
78-12	Northeast Monmouth Regional Sewerage Auth.	EPA	Permit condition, Compliance schedule	2/22/78	Pending	Sewage sludge
78-13	Town of West New York	EPA	Permit condition, Compliance schedule	2/22/78	Final Order-12/13/78 Revision of schedule	Sewage sludge
78-14	Borough of Atlantic Highlands	EPA	Permit condition, Compliance schedule	2/21/78	Final Order-9/26/78 Revision of schedule	Sewage sludge
78-15	City of Asbury Park	EPA	Permit condition, Compliance schedule	3/21/78	Final Order-8/31/78 Revision of schedule	Sewage sludge

TABLE VII
ENFORCEMENT ACTIONS (CONT.)

ORDER NO.	RESPONDENT'S NAME	REFERRAL FROM	TYPE OF VIOLATION	COMPLAINT ISSUED	DISPOSITION	DISPOSAL SITE
78-16	Bergen County Utilities Auth.	EPA	Permit condition, Compliance schedule	Waived	Final Order-12/28/78 Revision of schedule	Sewage sludge
78-17	Town of Kearny	EPA	Permit condition, Compliance schedule	9/1/78	Final Order-12/8/78 Monthly reports required	Sewage sludge
78-18	Modern Trans. & PCI Corp.	EPA	Permit condition, Compliance schedule	Waived	Final Order-9/8/78 $3,000 penalty payment and revision of schedule	Sewage sludge
78-21	Squibb Mfg., Inc.	EPA	Permit condition, Compliance schedule	Waived	Final Order-12/28/78 $12,000 penalty payment Revision of schedule	Chemical waste P. R.
Region III						
	City of Philadelphia	EPA	Failure to adhere compliance schedule and reporting requirements	filed suit in Fed. Dist. Court 6/12/78	Final Order-5/30/79 $2,165,000 penalty (consolidated with NPDES violation)	Philadelphia
Region VI						
	Carina Maritime Corp. TTT Ships Agent Inc.	USCG	Dumping without a permit	11/16/78	Pending	7.2 miles off Galveston south jetty
Region IX						
	Fishing vessel #17 Jinan, Rep. of Korea; towing vessel Nam Hae #223.	USCG	Disposal without compliance to general permit for disposing of vessel at sea	1/25/78	Cooperation of ship's Captain and emergency situation determined no penalty assessment	Pacific Ocean, 74 miles SW of Pago Pago

RESEARCH AND DEVELOPMENT

The Office of Research and Development (ORD) supports the enforcement and permitting functions of EPA through the technical expertise of its scientists. Attendant to these are the research projects which are ongoing and form the data base of support for the guideline and decision-making functions of the Agency.

Marine research in ORD strengthens the technological and scientific basis for Agency decisions on waste disposal in marine waters, and protection of the marine environment through control of sources of pollution.

The following marine research projects are of either direct or indirect importance to the Ocean Dumping Program.

Directly Related to Ocean Dumping

Bioassay Manual

A manual (published May 1976) describing bioassay procedures for evaluating waste materials for the ocean dumping program was updated in 1978. Work on refinement and updating of procedures in this manual is a continuing process.

A methods manual to determine the effects of selected complex organic wastes on marine organisms and ecosystems will be published in June 1979. These assays include static and flowing water bioassays with fish, macroinvertebrates, and phytoplankton. In addition, life cycle bioassays and culture methods for silversides, Menidia, have also been developed, providing new screening procedures.

Dredged Material Bioassay

The research conducted under this project will improve bioassays suitable for testing potential ecological effects of dredged material disposal in the marine environment. Both the water column and benthic components are addressed in these studies.

Petrochemical Bioassays

A series of studies is being conducted which involve the toxicity of petrochemicals and energy related organics during ocean dumping and offshore petroleum recovery activities. Toxicity tests on single species and communities are being developed for selected components

of drilling muds and cuttings, and man-mobilized petroleum hydrocarbons. Mutagenic, carcinogenic, and teratogenic potential of shale-oil will be examined and toxicity tests will be conducted on shale-oil derived marine diesel fuel.

Benthic Bioassay (Sub-lethal)

The objective of this research is to develop a benthic bioassay system, based sub-lethal responses of deposit-feeding fauna (e.g., Nephtys, Yoldia, and Nucula) to pollutant stresses. Quantification of normal biological parameters such as growth rates, reproductive seasons, feeding, and burrowing rates, metabolic rate/temperature relationship, and laboratory food requirements, are preliminary to studies on the effects of pollutants on these parameters. The final test system will examine in routine bioassay an array of organic, inorganic, and mixed contaminants which may impact the benthos.

Contaminant Flux from Marine Sediments

The objectives of this work are to gather information needed for developing disposal guidelines which will minimize environmental impacts of wastes caused by heavy metal and organic chemical pollutants and to determine circumstances which inhibit nutrient recycling. Three supporting projects are: 1) a study of benthic fluxes and pore water chemistry to assess the impact of pollutants on and around a dredged material site; 2) a continuing study of benthic fluxes and pore water chemistry to understand how sediment pollutant and chemical properties affect trace metal release; and 3) a comparison of metal, hydrocarbon and polychlorinated biphenyl (PCB) contents of dredged material and surrounding sediments to assess the feasibility for using metal as tracers for hard-to-measure organic pollutants.

Field Method Development

The objectives of this work are to identify indices which are most useful in quantitative impact assessment, and to determine the efficiency of biomathematical indices of various population parameters (diversity, dominance, richness, and spatial-temporal heterogeneity) for measuring the impact of pollution in marine ecosystems.

Three reports which define sampling techniques and guidelines for marine macrobenthos, zooplankton and phytoplankton for quantitative monitoring programs have been published (Ref. 2, 3, 4).

Statistical Methods Development

The development of statistical methods for quantifying stress on marine communities is in progress. The approach used determines the efficacy of various ecological values as measures of impact of pollution in marine habitats. A community structure in different biogeographical provinces will be assessed for reactions to pollutant stress.

Sewage Sludge Disposal

The characterization of pollutant behavior and ecosystem response associated with marine waste disposal has been a goal of studies in the New York Bight. The objective of these studies determines chemical-physical behavior of contaminants and ecosystem response to perturbations associated with municipal wastewater discharge, diffuse source inputs, and disposal of dredged material. Oceanographic data were obtained before, during, and at various time intervals after specific dumpings of sewage sludge.

Three publications have resulted from studies on the effects of sewage sludge discharged in the New York City Bight. (Ref. 5, 6, 7).

Indirectly Related to Ocean Dumping

Several programs are related to ocean dumping interests sharing common research objectives and outputs (Ref. 8, 9). Some of these are mentioned below.

Environmental assessment and the development of bioassays continues to be important in the research and development objectives of the program. This program provides assistance in the determination of specific levels of control on industrial wastes impacting marine environments and in the development of marine bioassay procedures for on-site evaluation of the waste stream control.

The objective of other bioassay development work is to define the kinetics of a variety of pollutants at low concentrations and examine these for uptake, depuration, histopathological damage, and effects on reproduction. These studies address arsenic, copper, cadmium and petroleum hydrocarbons with inclusion of chlorinated organics in the next year. Results of metal bioaccumulation studies are available in published and unpublished manuscripts from the project.

Other related bioassay research develops methods to establish lethal and sublethal limits for short and long term exposure of selected marine organisms in waters impacted by man. Field verification of bioassay results from laboratory-controlled exposures will be attempted, and measurement of exposure conditions will be made by an automated submerged water sampling apparatus designed to provide a series of integrated measurements of selected pollutants.

The following research projects are focused upon chemical methodologies and ecosystem measurements in response to marine waste disposal or its abatement.

Marine Instrumental Analysis

This research is concerned with analysis of marine samples of water, organisms, and sediments by neutron activation analysis, flame and flameless atomic absorption, and alpha particle spectrometry.

Marine Chlorination Research

Another research effort seeks to identify the chlorine-containing and bromine-containing organic compounds which are formed when chlorine is added to seawater. Total organic halogenated compound yields are measured, then the reaction products are fractionated, using selective solubility and thin layer chromatography. Characterization is carried out using gas chromatographic-mass spectral techniques and additional characterization based on UV and IR spectra with NMR for special cases. Conference reports are published annually. (Ref. 10)

Microcosm Simulation

Other research has used laboratory microcosms to develop marine microcosm methodology, comparing small and large microcosm behavior. Some assessments measure the effects of sewage sludge application and recovery, or time specific studies of multiple stresses on microcosms. This on-going work helps us understand aspects of stability and resiliency in estuarine and marine ecosystems.

Recovery of Damaged Ecosystems: Stress Relaxation Research

The objectives of the studies are to determine to what extent and at what rate does a tropical coral reef/estuary ecosystem return to pre-stress conditions after abatement of sewage sludge disposal. Both field and laboratory monitoring experiments yield two years of time-series pre-diversion baseline data and one year of post-diversion recovery data. Documentation of recovery characteristics and predictive ability is found in the most recent annual report entitled: "Kaneohe Bay Sewage Relaxation Experiment: Pre-diversion Report" (Ref. 11). Several other papers and two annual reports have been published to date. These studies have wide applications and form part of a series which includes descriptions of biogeographic areas. Comprehensive research studies include tropical (Kaneohe Bay, Hawaii), subtropical (Miami, Florida), and southern and northern temperate marine ecosystem (Los Angeles Bight; New York Bight; Narragansett Bay; Rhode Island; Duwamish River, Washington).

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APPENDIX A

RESOLUTION AND AMENDMENTS ON INCINERATION AT SEA

CONVENTION ON THE PREVENTION OF MARINE POLLUTION BY DUMPING OF WASTES AND OTHER MATTER

INCINERATION AT SEA

Resolution adopted on 12 October 1978

THE THIRD CONSULTATIVE MEETING,

RECALLING Article I of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, which provides that Contracting Parties shall individually and collectively promote the effective control of all sources of pollution of the marine environment,

HAVING NOTED the use of incineration at sea as a means of disposal of wastes containing highly toxic substances and the consequent risks of marine and atmospheric pollution which may result from this process,

DESIRING to prevent such pollution and to minimize the risk of hazards to other vessels or interference with other legitimate uses of the sea which could arise from incineration operations at sea,

RECOGNIZING present methods of incineration at sea as being an interim method of disposal of wastes pending the development of environmentally better solutions, considering at all times the best available technology,

AFFIRMING that the intention of the adoption of mandatory provisions for the control of incineration at sea is not to increase the amounts and kinds of wastes or other matter incinerated at sea for which there are available practical alternative land-based methods of treatment, disposal or elimination,

REAFFIRMING that, in accordance with Article IV(3) of the Convention, Contracting Parties can apply additional regulations for incineration at sea on a national basis,

NOTING that Article VIII of the Convention encourages Contracting Parties, within the framework of regional conventions, to develop further agreements reflecting the conditions of the geographical area concerned,

RECALLING the decision of the Second Consultative Meeting that provisions for the control of incineration at sea should be implemented by Contracting Parties on a mandatory basis in the form of a legal instrument adopted within the framework of the Convention (LDC II/11, Annex II),

HAVING CONSIDERED the proposed amendments to the Annexes of the Convention for the control of incineration at sea contained in the Report of the Ad Hoc Group of Legal Experts on Dumping,

ADOPTS the following amendments to the Annexes to the Convention in accordance with Articles XIV(4)(a) and XV(2) thereof:

(a) addition of a paragraph 10 to Annex I;

(b) addition of a paragraph E to Annex II; and

(c) addition of an Addendum to Annex I, containing Regulations for the Control of Incineration of Wastes and Other Matter at Sea,

the texts of which are set out in Attachment to this Resolution,

ENTRUSTS the Inter-Governmental Maritime Consultative Organization with the task of ensuring, in collaboration with the Governments of France, Spain, the Union of Soviet Socialist Republics and the United Kingdom, that the texts of the above Amendments are drawn up by 1 December 1978 in all official languages of the Convention with the linguistic consistency in each text, which would then become the authentic text of the Annexes to the Convention in the English, French, Russian and Spanish languages,

RESOLVES that for the purposes of Articles XIV(4)(a) and XV(2) of the Convention, 1 December 1978 shall be treated as the date of the adoption of the amendments,

REQUESTS the Secretary-General of the Organization to inform Contracting Parties of the above-mentioned amendments,

REQUESTS the Ad Hoc Group on Incineration at Sea to prepare draft Technical Guidelines for the Control of Incineration of Wastes and Other Matter at Sea with a view to adoption by the Fourth Consultative Meeting,

INVITES Contracting Parties to implement, as an interim measure, the existing Technical Guidelines (LDC II/II, Annex II, with amendments (IAS/9, Annex IV)) and the notification procedure set out in Annex 2 to LDC III/12.

Attachment

AMENDMENTS TO ANNEXES TO THE CONVENTION ON THE PREVENTION OF MARINE POLLUTION BY DUMPING OF WASTES AND OTHER MATTER CONCERNING INCINERATION AT SEA

The following paragraph shall be added to Annex I:

10. Paragraphs 1 and 5 of this Annex do not apply to the disposal of wastes or other matter referred to in these paragraphs by means of incineration at sea. Incineration of such wastes or other matter at sea requires a prior special permit. In the issue of special permits for incineration the Contracting Parties shall apply the Regulations for the Control of Incineration of Wastes and Other Matter at Sea set forth in the Addendum to this Annex (which shall constitute an integral part of this Annex) and take full account of the Technical Guidelines on the Control of Incineration of Wastes and Other Matter at Sea adopted by the Contracting Parties in consultation.

The following paragrpah shall be added to Annex II:

E. In the issue of special permits for the incineration of substances and materials listed in this Annex, the Contracting Parties shall apply the Regulations for the Control of Incineration of Wastes and Other Matter at Sea set forth in the Addendum to Annex I and take full account of the Technical Guidelines on the Control of Incineration of Wastes and Other Matter at Sea adopted by the Contracting Parties in consultation, to the extent specified in these Regulations and Guidelines.

ADDENDUM

REGULATIONS FOR THE CONTROL OF INCINERATION OF WASTES AND OTHER MATTER AT SEA

PART I

REGULATION 1

Definitions

For the purposes of this Addendum:

(1) "Marine incineration facility" means a vessel, platform, or other man-made structure operating for the purpose of incineration at sea.

(2) "Incineration at sea" means the deliberate combustion of wastes or other matter on marine incineration facilities for the purpose of their thermal destruction. Activities incidental to the normal operation of vessels, platforms or other man-made structures are excluded from the scope of this definition.

REGULATION 2

Application

(1) Part II of these Regulations shall apply to the following wastes or other matter:

(a) those referred to in paragraph 1 of Annex I;

(b) pesticides and their by-products not covered in Annex I.

(2) Contracting Parties shall first consider the practical availability of alternative land-based methods of treatment, disposal or elimination, or of treatment to render the wastes or other matter less harmful, before issuing a permit for incineration at sea in accordance with these Regulations. Incineration at sea shall in no way be interpreted as discouraging progress towards environmentally better solutions including the development of new techniques.

(3) Incineration at sea of wastes or other matter referred to in paragraph 10 of Annex I and paragraph E of Annex II, other than those referred to in paragraph (1) of this Regulation, shall be controlled to the satisfaction of the Contracting Party issuing the special permit.

(4) Incineration at sea of wastes or other matter not referred to in paragraphs (1) and (3) of this Regulation shall be subject to a general permit.

(5) In the issue of permits referred to in paragraphs (3) and (4) of this Regulation, the Contracting Parties shall take full account of all applicable provisions of these Regulations and the Technical Guidelines on the Control of Incineration of Waste and Other Matter at Sea for the waste in question.

PART II

REGULATION 3

Approval and Surveys of the Incineration System

(1) The incineration system for every proposed marine incineration facility shall be subject to the surveys specified below. In accordance with Article VII(1) of the Convention, the Contracting Party which proposes to issue an incineration permit shall ensure that the surveys of the marine incineration facility to be used have been completed and the incineration system complies with the provisions of these Regulations. If the initial survey is carried out under the direction of a Contracting Party a special permit, which specifies the testing requirements, shall be issued by the Party. The results of each survey shall be recorded in a survey report.

(a) An initial survey shall be carried out in order to ensure that during the incineration of waste and other matter combustion and destruction efficiencies are in excess of 99.9 per cent.

(b) As a part of the initial survey the State under whose direction the survey is being carried out shall:

(i) approve the siting, type and manner of use of temperature measuring devices;

(ii) approve the gas sampling system including probe locations, analytical devices, and the manner of recording;

(iii) ensure that approved devices have been installed to automatically shut off the feed of waste to the incinerator if the temperature drops below approved minimum temperatures;

(iv) ensure that there are no means of disposing of wastes or other matter from the marine incineration facility except by means of the incinerator during normal operations;

(v) approve the devices by which feed rates of waste and fuel are controlled and recorded;

(vi) confirm the performance of the incineration system by testing under intensive stack monitoring, including the measurements O_2, CO, CO_2, halogenated organic content, and total hydrocarbon content using wastes typical of those expected to be incinerated

(c) The incineration system shall be surveyed at least every two years to ensure that the incinerator continues to comply with these Regulations. The scope of the biennial survey shall be based upon an evaluation of operating data and maintenance records for the previous two years.

(2) Following the satisfactory completion of a survey, a form of approval shall be issued by a Contracting Party if the incineration system is found to

be in compliance with these Regulations. A copy of the survey report shall be attached to the form of approval. A form of approval issued by a Contracting Party shall be recognized by other Contracting Parties unless there are clear grounds for believing that the incineration system is not in compliance with these Regulations. A copy of each form of approval and survey report shall be submitted to the Organization.

(3) After any survey has been completed, no significant changes which could affect the performance of the incineration system shall be made without approval of the Contracting Party which has issued the form of approval.

REGULATION 4

Wastes Requiring Special Studies

(1) Where a Contracting Party has doubts as to the thermal destructibility of the wastes and other matter proposed for incineration, pilot scale tests shall be undertaken.

(2) Where a Contracting Party proposes to permit incineration of wastes or other matter over which doubts as to the efficiency of combustion exist, the incineration system shall be subject to the same intensive stack monitoring as required for the initial incineration system survey. Consideration shall be given to the sampling of particulates, taking into account the solid content of the wastes.

(3) The minimum approved flame temperature shall be that specified in Regulation 5 unless the results of tests on the marine incineration facility demonstrate that the required combustion and destruction efficiency can be achieved at a lower temperature.

(4) The results of special studies referred to in paragraphs (1) (2) and (3)

of this Regulation shall be recorded and attached to the survey report. A copy shall be sent to the Organization.

REGULATION 5

Operational Requirements

(1) The operation of the incineration system shall be controlled so as to ensure that the incineration of wastes or other matter does not take place at a flame temperature less than 1250 degrees centigrade, except as provided for in Regulation 4.

(2) The combustion efficiency shall be at least 99.95± 0.05% based on:

$$\text{Combustion efficiency} = \frac{C_{CO_2}}{C_{CO} + C_{CO_2}} \times 100$$

where C_{CO_2} = concentration of carbon dioxide in the combustion gases

C_{CO} = concentration of carbon monoxide in the combustion gases.

(3) There shall be no black smoke nor flame extension above the plane of the stack.

(4) The marine incineration facility shall reply promptly to radio calls at all times during the incineration.

REGULATION 6

Recording Devices and Records

(1) Marine incineration facilities shall utilize recording devices or methods as approved under Regulation 3. As a minimum, the following data shall be recorded during each incineration operation and retained for inspection by the Contracting Party who has issued the permit:

(a) continuous temperature measurements by approved temperature measuring devices;

(b) date and time during incineration and record of waste being incinerated;

(c) vessel position by appropriate navigational means;

(d) feed rates of waste and fuel - for liquid wastes and fuel the flow rate shall be continuously recorded; the latter requirement does not apply to vessels operating on or before 1 January 1979;

(e) CO and CO_2 concentration in combustion gases;

(f) vessel's course and speed.

(2) Approval forms issued, copies of survey reports prepared in accordance with Regulation 3 and copies of incineration permits issued for the wastes or other matter to be incinerated on the facility by a Contracting Party shall be kept at the marine incineration facility.

REGULATION 7

Control over the Nature of Wastes Incinerated

A permit application for the incineration of wastes or other matter at sea shall include information on the characteristics of wastes or other matter sufficient to comply with the requirements of Regulation 9.

REGULATION 8

Incineration Sites

(1) Provisions to be considered in establishing criteria governing the selection of incineration sites shall include, in addition to those listed in Annex III to the Convention, the following:

(a) the atmospheric disperal characteristics of the area - including

wind speed and direction, atmospheric stability, frequency of inversions and fog, precipitation types and amounts, humidity - in order to determine the potential impact on the surrounding environment of pollutants released from the marine incineration facility, giving particular attention to the possibility of atmospheric transport of pollutants to coastal areas;

(b) oceanic dispersal characteristics of the area in order to evaluate the potential impact of plume interaction with the water surface;

(c) availability of navigational aids.

(2) The coordinates of permanently designated incineration zones shall be widely disseminated and communicated to the Organization.

REGULATION 9

Notification

Contracting Parties shall comply with notification procedures adopted by the Parties in consultation.

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